

A Study on the Engagement Levels of Mature and Traditional Students in Engineering with Mathematics Learning Support

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Outline

- 1 Introduction and Motivation
 - Introduction to Mathematics Learning Support
 - Motivation and Outline of Study
- 2 Results
 - Qualitative Results
 - Quantitative Results



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Definition of MLS

- MLS is defined as *a facility offered to students (not necessarily of mathematics) which is in addition to their regular programme of teaching through lectures, tutorials, seminars, problems classes, personal tutorials, etc.*(Lawson *et al.* 2003)
- Non-compulsory, free service available to all students
- Delivered primarily through a drop-in service
- One-to-one tuition in an informal, relaxed and non-judgmental manner



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Operational Details.

- In DIT manned mostly by postgraduate students in Mathematics
- Open 21 hours a week for 12 weeks each semester
- Over 1100 visits
- Majority from outside pure mathematical programmers e.g. Computer Science, Engineering, Biology, Finance etc.



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Extent of MLS

- Established in majority of Irish and UK Higher Education Institutes (HEIs)
- 85% of UK HEIs offer some form of MLS (Perkin *et al.* 2012)
- Regularly at the 'front line' for funding cut backs
- Self Evaluations are vital to ensure continued funding (Mac an Bhaird *et al.* 2013)
- Established method- mixture of qualitative and quantitative analysis



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Motivation

- An important issue arising from evaluations is non-engagement of 'at risk' student with MLS (Mac an Bhaird *et al.* 2013)
- In DIT, disproportionately high engagement levels with mature students
- 42% of registered Engineering students were mature students
- We seek to investigate the reasons behind these high engagement levels



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Outline of Study.

- Two focus groups were conducted
- Comparison of exam scores of who did/did not attend centre



Participants

- Participants consisted entirely of mature students in the first year of an Engineering undergraduate
- Focus group 1 -10 students who attended the Maths Learning Support Centre several times
- Focus group 2- 4 students who never attended the MLSC
- Quantitative analysis - 18 students from one course, 6 attendees 12 non attendees



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Main Themes

- Motivation
- Reasons for non attendance
- Perceptions of traditional (non mature) students



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Motivations

- Practical motivations -financial or lack of availability of other supports
- Wish to gain a deep understanding of subject, not just pass the exam
- The one-to-one support available in the centre
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Motivations

- **Life experiences** *it's that experience of having been at the bottom, you know and having to try and survive at the bottom, that you realise that when you get an opportunity like this, just how important it is to really avail of all the services, in my opinion the Maths Learning Centre being the most important that I've come across so far...*



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Reasons for Non-Engagement

- Lack of need
- Issues with the structures of the MLSC e.g. opening hours locations
- Mature students who have had a transition year appear to have less of a need for the extra support



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Perceptions of Traditional Students

- Traditional Students are better prepared
- Non compulsory nature has a negative effect on engagement
- Reticence of youth
- Traditional students rely more on peer support e.g. studying in large groups etc.



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Comparison of exam results

- 18 participants, ordinary level mechanical engineering degree
- 6 attendees, 12 non attendees

Attended MLSC	N	Mean grade	Standard Deviation
Yes	6	80.6	18.9
No	12	68.4	23

- Difference in means is not significant (t test, $p=0.25$)
- No common baseline on which to work from, small sample size



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Summary

- **Mature students motivation is multi-faceted**
 - Practical reasons
 - Motivated by life experiences
 - Desire to gain deep understanding
- Non attendance mostly in-line with literature
- Those who had a transition year have less need for support
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Future Work

- Investigate the non engagement of traditional students further
- Extend Quantitative analysis to larger group of students and benchmark students on entry



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For Further Reading I



A. Lawson, D., Croft, A.C. & Halpin, M

Good practice in the provision of mathematics support centres, learning and teaching in mathematics, statistics and operational research.

LTSN Maths, Stats & OR Network 2003.



A. Perkin, G., Lawson, D. & Croft, T.

Mathematics Learning Support in Higher Education: the extent of current provision in 2012.

Sigma, Coventry: Coventry University 2012



For Further Reading II



A. Mac An Bhard, C., Fitzmaurice, O., Ní Fhloinn, E. & O'Sullivan, C

Student non-engagement with mathematics learning supports.

Teaching Mathematics and Its Applications (2013) 32, 191-205

